Real time social media analysis in emergency management: Written Evidence

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EVIDENCE BASE

The evidence provided in this briefing note is from research funded by the EPSRC (Engineering and Physical Sciences Research Council) and the ESRC (Economic and Social Research Council) entitled 'Game Theory and Adaptive Networks for Smart Evacuations' (grant reference EP/I005765/1). The project brought together research expertise from both the physical and social sciences, i.e. computer studies, crisis education, econometrics, physics (agent and network modelling), policy studies and strategy. One of the key themes examined in the research was the extent to which and how social media use, by both the public and government, could impact communication exchange during a city-level evacuation. The research was informed by policy makers and practitioners at both the national and local level throughout and reported to a high-level Advisory Board drawn from organisations such as The Cabinet Office and The Home Office. Representatives from three UK case study cities were consulted at the start of the project about their needs in this area and two years later we returned to these groups to present our findings. In addition, we interviewed and consulted experts from UK government, social media agencies, Department of Homeland Security and FEMA (Federal Emergency Management Agency). Aside from international academic conferences the results of the project were also presented to the Cabinet Office, Department of Homeland Security, the Home Office, the National Steering Committee for Warning and Informing the Public (NSCWIP), a range of UK local authorities (Essex, Plymouth and Exeter), to experts from the sampled cities and at two breakfast events held at the Houses of Parliament organised by the Industry and Parliament Trust.

This briefing restricts itself to speak to question 1 in line with its focus and evidential base.

HOW CAN REAL-TIME ANALYSIS OF SOCIAL MEDIA DATA BENEFIT THE UK? WHAT SHOULD THE GOVERNMENT BE DOING TO MAXIMISE THESE BENEFITS?

Social media as a communication and data collection tool may have benefits for emergency management when used effectively. The use of social media for crisis communication and management is most effective when:

1. Information from government / emergency managers is both accurate and timely.
2. When the emergency management team has an orientation towards social media.
3. When the emergency management team have social media capabilities such as a) technology use, b) ability to analyse social media content and b) 'soft skills' such as knowing how to respond/ intervene
4. When social media is used habitually by both the public and emergency responders.

5. When social media is pro-actively monitored.
6. When social media is used in conjunction with other forms of media (in terms of increasing both the proportion of the population informed and equity).
7. When a pre-existing crisis communication plan (including social media) is in place.
8. When social media is used to source outlying/ first-hand observer information (e.g. harnessing its question asking function).
9. When social media is used to harness knowledge and resource within the community.

THE DRAWBACKS OF SOCIAL MEDIA IN EMERGENCY MANAGEMENT I.E. THAT MAY REQUIRE MITIGATION BY GOVERNMENT

a) Communication between agents does not always lead to improved outcomes. Example 1: In one of our evacuation simulations if the number of communicating agents exceeds the optimal ratio then agents are 'over informed' and frequently change their routes during the process, slowing down the overall efficiency of the evacuation. Example 2: In a simulation of the evacuation of a UK city, communication between agents caused congestion.
b) Social media currently is less effective than old media as a mechanism for an initial warning.
c) Social media has a selective demographic effect and is not always progressive in terms of equity and representation.
d) Cellular and 3G/4G network coverage is an issue in some UK regions (important if Smartphones are part of emergency management strategy).

WHAT ARE THE BARRIERS TO IMPLEMENTING REAL TIME DATA ANALYSIS? IS THE NEW GOVERNMENT DATA-CAPABILITY STRATEGY SUFFICIENT TO OVERCOME THESE BARRIERS?

a) Real time data analysis is difficult to manage and subject to abuse
b) Suspicion and wariness exists as Government officers are generally worried about losing control to private sector providers
c) Security issues clearly exist (cyber security threats) to real time data analysis in practice - e.g. "fake players" abusing the system
d) Although real time data processes can easily generate larger sample sizes for more representative survey results in a timelier way, our research suggests that the quality of information gathered is lower than more considered analysis
e) A particularly significant finding from the research was that by using statistical methods to automatically cluster textual data, we can identify outliers (or weak signals) about likely or emerging extreme events (e.g. evacuations) to allow earlier detection of impending crises before they occur. This finding could be further considered in data analysis strategies.

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